#4

An Inquiry

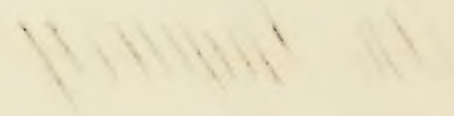
Into the causes Symptoms and Cure

of

Biliary Calculi.

Submitted to the examination of the Provost,
Trustees, and Medical Professors of the
University of Pennsylvania

1813.



An Inquiry &c

The liver is the largest, and one of the most important viscera in the body. A detailed description of it in this place would be unnecessary, but a short account will perhaps be serviceable, to the elucidation of the following remarks. It is situated in the right hypochondriac region, extending partly into the left, this is most common in females in consequence of the smallness of their wastes naturally, and not unseldom from their fashionable mode of dressing. By this baneful practice the liver is deranged, and the sallow colour of some ladies may be owing to this pressure.

It is divided into three lobes, the right and left and the Lobulus Spigelii which is placed on the upper, and posterior part of it.

It is very vascular, and is composed almost entirely of vessels.

It lies contiguous to the diaphragm, stomach, pancreas, spleen, intestines and in fact nearly all the abdominal viscera; hence when any of them are diseased, the liver from its adjacent situation is called into sympathy.

The manner in which it is confined in its proper place, is by means of ligaments formed by duplicates of the peritoneum.

The coeliac artery, after leaving the aorta sends off three great branches, one of which is the hepatic artery. This giving off several branches arrives at the liver less in bulk, than at its origin. It affords nourishment to this viscus. The vena portarum which pours the blood into the liver from every part of the body to be there acted on in such a way as to perfect it, and for the secretion of bile. The bile is then carried ~~[illegible]~~ by the hepatic duct, which unites with the cystic forming the ductus communis choledicus

into the duodenum.

"The design of the liver I believe to receive the blood from every part of the body, in order to subject that part of it which had not been completely animalized, or divested of its chylous properties to a secretory process; and afterwards to pour the product of the secretion, mixed with the liquor of the pancreas into the duode= =num, to be absorbed or otherwise taken up by the lacteals, and conveyed with the chyle from the stom= =ach into the bloodvessels in order to be completely converted into red blood, for the purpose of serving the various and important uses for which that fluid is intended in the human body." This theory of the liver, which has been said to be only chimerical will be in a very short time generally adopted. It is simple and satisfactory.

The gall-bladder, answers the same purpose to the liver that the spleen does to the whole body; that is it serves

as a waste gate."*

It would be a difficult, and arduous undertaking to dis-
-cover who first took notice of calculi, in the human
body: nor would the advantages arising from this dis-
-covery be sufficient to reward us for our trouble.
Among the first who observed biliary concretions we
may place Fernelius. He found them on dissection,
and according to Coe originally perceived them in
the faeces. Benevenius mentions one that was found in
the gall-bladder. They were likewise known to Fallo-
-pius, and Bealius. Kentmannus was as far as we can
perceive original, in describing the different sorts and figures of calcu-
-li. It is said that his description though brief, was much
the best that had appeared at the time he wrote, and
all physicians regretted was, that he did not make
more remarks on the subject. Whoever may be the dis-
coverer, they are now admitted to be one of the most
distressing diseases to which mankind is subject.

* Rush on the liver, and gall-bladder.

In order to render the succeeding observations plain, and comprehensible, it will be proper to make a few general remarks on sympathy.

Animal life is a forced state. This fact which was once looked upon as inconsistent, and is even now reviled by many, rests so firmly on the pillars of truth, that it will stand unmoved amid the billows of time.

The human body is one great whole, so intimately connected that no particular part can act with regularity without consent of the others. Stimuli or impressions applied to one part producing motion, will excite it in others. To this peculiar power physiologists have given the name of sympathy.

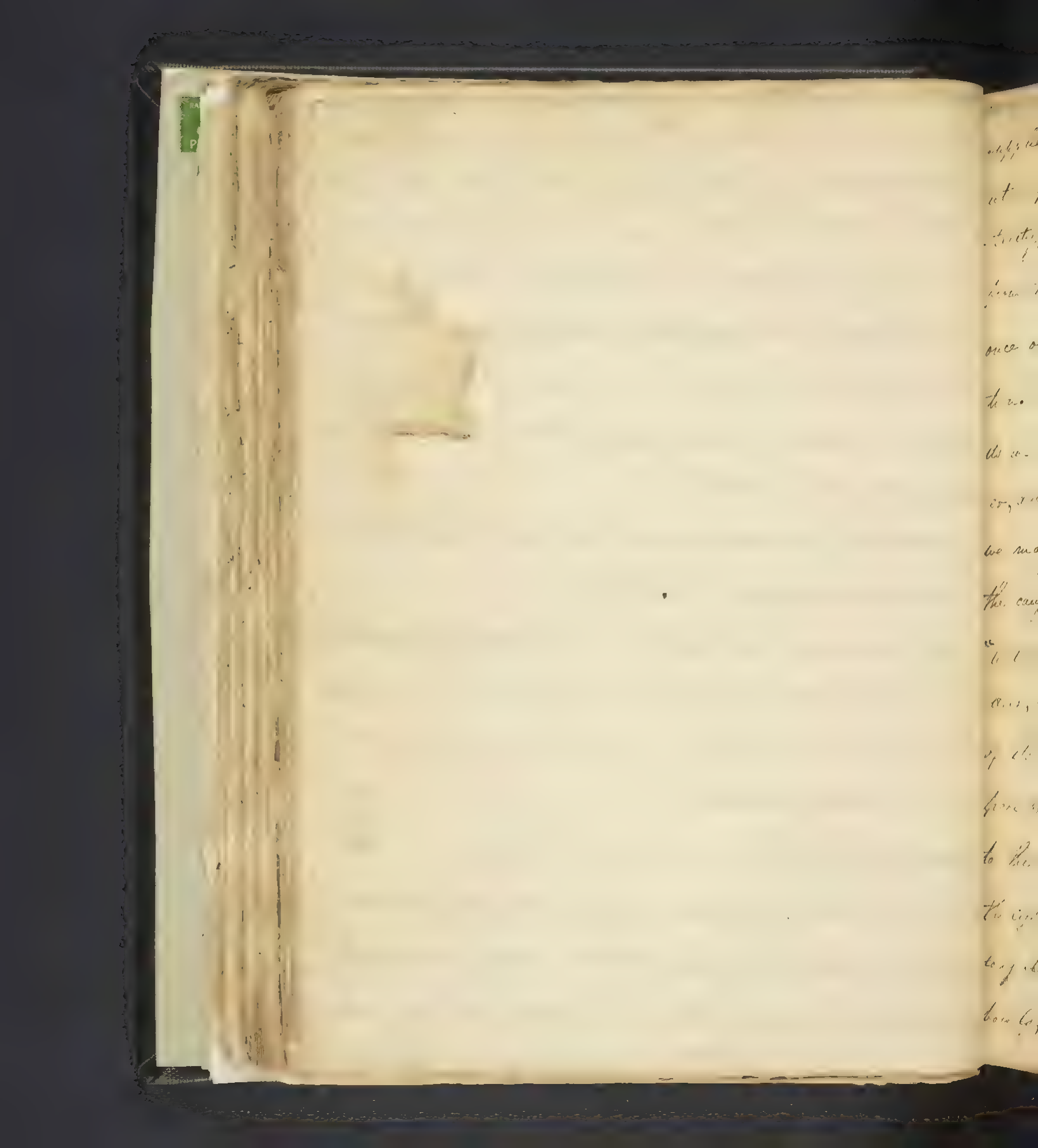
Stimuli taken into the stomach, act on the excitability and sensibility of that organ creating motion, or the power of life, which is distributed over the different parts of the body in proportion to their contiguity, irritability or sensibility. Thus when the stomach is affected in a

violent manner by disease, or extraneous substances, the liver and adjoining viscera are much excited. The systole and diastole of the heart, are quick, and irregular in consequence of its great stimulability, and the brain is similarly excited by the sympathy existing between it, and the stomach, and the increased circulation of the blood. A similar consent of action exists, between the different parts of the system.

When depression, or debility occurs in any organ, it is to be propagated throughout the body.

The liver suffers by the affections of the stomach, intestines &c. This debility causes a stagnation of bile, at which time its thinner parts are taken up by the absorbents, and the former remain behind.

The reason why the liver is so apt to be diseased in warm climates, is for the most part owing, to the dampness and heat of the atmosphere, independent in many cases of the various, and pernicious habits of the people. The liver being



supplied with but a small artery, receives only a diminutive portion of oxygenated blood, and possesses little irritability, or excitability. The consequence is that it suffers from the influence of these and other impressions, and when once out of order, it is hard to regain its accustomed function.

As we have now shewn the dependence of one part on another, and particularly the liver on the abdominal viscera, we may enter more minutely into the consideration of the causes of Biliary Calculi.

"[illegible] be[illegible] secreted from the torpid state of the liver, and absorption of its thinner parts, in consequence of its long detention in that viscus, is formed from the glandular substance into the hepatic duct, it passes through that to the common gall duct, from which it regurgitates through the cystic duct to the gall-bladder, there suffering another long detention from the torpid state of the stomach, and bowels, the thinner aqueous parts of the bile escape and

are reabsorbed into the general circulation, while the thicker
settle to the bottom of the separate tubes; these gradually hard-
-en from the loss of their principle of solution, until they
eventually become the first layer or nucleus of the future
gall stone. Upon the influx of a fresh portion of bile into
the gall bladder, the thickest and saline particles attach
themselves to the concretion already formed and these crystal-
-lize forming another concentric <u>lamina</u>. In this manner
one or more gall stones are formed in the gall bladder,
which may remain perfectly harmless for a series of years,
provided they do not fall into the duct, nor become impacted
in its mouth so as to obstruct the flow of hepatic bile into
the <u>ductus communis Choledochus</u>."

I recollect having been present a few years ago at the examina-
-tion of a man who had died phthisical at the age of sixty-five
or seventy from an inguinal abscess. He had been remarkably
robust during his whole life, untill just before his decease,
and when he died the cells of his adipose membrane were

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much distended with fat. Upon making an incision into the gall-bladder, I saw chocolate colored gall-stones of a prismatic form, perfectly smooth and polished about the size of common beach-nuts were discovered. He had never been troubled with any disease of the liver from that source".*

My friend Dr Lamm, after opening the gall-bladder of a subject he was dissecting found in it twenty seven concretions of an angular form. Some of them so soft as to yield to the pressure of the fingers. By placing them in the fire, they melted like wax, as has been observed by Morgagni and other writers. They were specifically heavier than water, contrary to the general opinion of them which is that they are specifically lighter. Some concretions of this nature, on exposure to flame, immediately take fire, melt and fall down in drops. I have said that the origin of most of the biliary calculi, was the effect of the stagnation of bile. I shall now mention some of the causes of this stagnation.

* Matthew on Biliary Concretions.

irritability existing in the adjacent viscera, will excite them
into sympathy, and produce a congestion in that organ.
A voluntary surgy like has a similar effect. When the
circulation of the blood is in any manner affected, these
concretions may form; thus they are frequently met with
in old people, and in women after the age of fifty. The
different passions anger, grief, excessive joy, and the use
of ardent liquors have a similar tendency. Some
authors have explained the manner in which liquors have
this effect, by their coagulating quality, and the heat pro-
duced thereby dissipating the watery particles of the bile;
but this explanation is certainly incorrect. It is rather
unlimited to suppose the heat of the body would be so
much raised as to produce this consequence. In my opinion,
they are caused only by creating indirect debility. The pas-
sions are to be considered in the same light. They either
produce indirect, similar to ardent spirits or direct debility.
It is known to every one, possessing the least degree of physio-

logical knowledge, that the circulation in the decline of life, and in women after the age of fifty, is considerably decreased: the former in particular from the decay of those stimuli venereal desire &c, which act powerfully in youth, and middle life; the latter from the cessation of menses increasing the volume of blood; Languor of the system of necessity takes place, in which the absorbents have time to take up the thin portion of bile leaving the firmer behind.

These concretions occur seldom in young people. Cases of this kind however are not wanting on record. There is one mentioned in the Medical Essays of London Vol. 2.

It happens sometimes that persons have all, or nearly all the causes which have been enumerated, and are yet devoid of concretions of this nature. This may appear surprizing to some, but to the man of observation it excites no wonder. Do not the generality of drunkards die with diseased livers? yet there are some who live almost in a continued state of inebriety for nearly a century, whose livers are perfect.

is found? Does not the [illegible] man frequently escape, even [illegible] paribus, when the young one is attacked? This is more wonderful because debility which is the predisposing cause of disease [illegible] [illegible] accompanies age. How are these occurrences which [illegible] equally difficult to be expounded? It must be owing to their predisposition, or it is inexplicable upon account of our ignorance of the animal economy.

The bile being the fluid of which the generality of these concretions are formed, it is proper to give an account of it. It is of a yellowish green colour, of a bitter taste secreted from the blood by the liver. Various uses have been [illegible] to the bile. Galen considered it as merely excrementitious, and Sidler affirmed that it was of no use at all.

Some physiologists have thought it necessary to the formation of chyle. This opinion Dr Fordyce proved incorrect, by actually tying up the ductus communis choledochus when chyle was formed. An experiment of Dr Saunders proves the same thing. "A dog was fed with animal food and in

three hours the abdomen was opened. A portion of the duodenum and jejunum of considerable length was cut open so the contents might be observed. Portions of food reduced to a pultaceous mass, were seen oozing through the pylorus. Bile was likewise observed to pass slowly out of its duct, which when carefully attended to, appeared to flow over the surface of the digested matter advancing to the intestine. By removing the bile from the surface of this digested matter it did not appear to have mixed with it in any manner.

Another objection which is brought forward is that in dogs digestion goes on without interruption.

For the most we know respecting the component parts of the bile, we are indebted to Gmelin, Berzelius, and Tiedemann. Thenard however has paid great attention to this subject. The following are the ingredients of human bile according to his experiments

water
yellow insoluble matter
yellow matter in solution
albumen
resin

... soda ...

... phosphate of soda, muriate of soda ...

... muriate of soda, phosphate of lime ...

... oxyde of iron ...

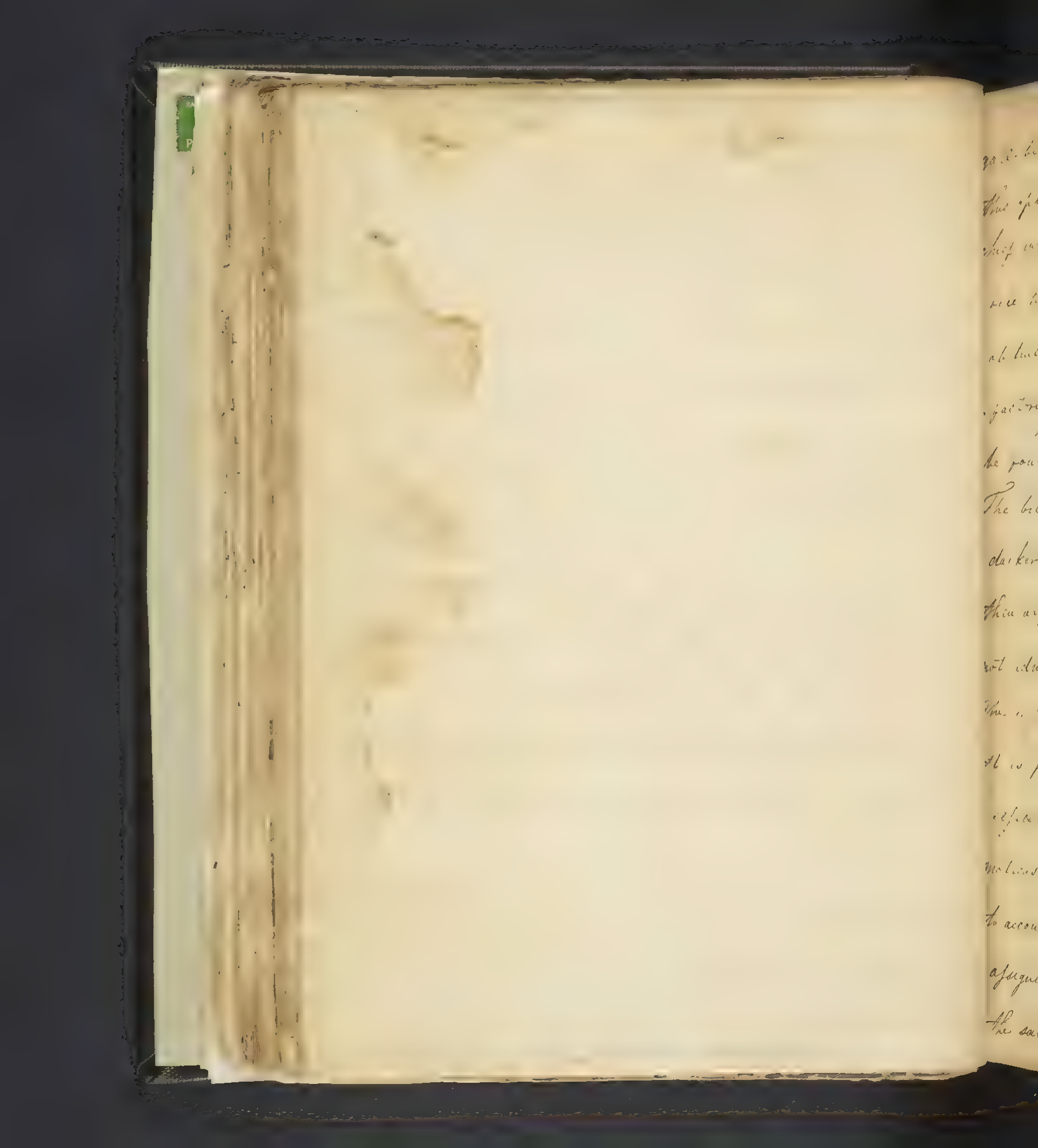
The yellow matter is insoluble in water, alcohol and ether, but soluble in alkalies.*

The importance of the bile is obvious, if we attend to its operations. When it is secreted in too small a quantity, or prevented from entering the intestines by a stoppage in the duct; or when it is poured out in excess; the symptoms are nausea, vomiting, and diarrhœa. Its principal uses are to stimulate the bowels, and render their excretions, and those of the stomach and liver complete; to promote those parts of the chyme which are destitute of nutriment, and to prevent its putrefaction.†

The diuretic property of the bile is well known. This is owing to some very respectable authors have affirmed among whom may be placed Dr Saunders, to the mucilaginous substance secreted by the

* Thomsons Chemistry.

† Rush on the diseases &c.



gall-bladder. There are however not sufficient proofs to support this opinion. It originated I fear in a belief, that this was the only intention of the gall bladder. From its structure and from bile having been found in it when the ducts were apparently obstructed, it was thought to secrete bile. This has been satisfactorily contradicted. When the cystic duct is tied no bile will be found in the vesicula felis.

The bile of the gall bladder is unquestionably of a thicker and darker appearance than that of the hepatic duct. A question then arises, what is the cause of this difference? If we do not admit the above statements, how is it to be accounted for? This is readily done by observing the situation of this viscus. It is placed on the upper concave part of the liver. It has also but a small degree of irritability, consequently its motions must be slow and sluggish. These are sufficient reasons to account for the alteration of bile, but some use must be assigned to the mucus, secreted by this viscus. Does it serve the same purpose to the gall-bladder that the mucus of the

intestines serves to them? Is it intended to abrogate the acrimony of the bile, which is sometimes great? or is it destined to answer this function in health, and another in disease?

Occasionally it happens that the passage of bile into the gall-bladder, is completely prevented. May not this mucus serve then as a temporary bile?

These are all conjectures, some abler and more experienced physiologist must decide the questions.

It appears that the bile is indispensable in the animal economy, and whenever its secretion, flow, quality, or passage is unnatural, disease will be the consequence.

The causes of its obstruction in the ductus communis choledochus are what justly come under our observation in this essay.

These are 1. Biliary calculi

2. Spasm in the duct and intestine.

3. Inflammation of the liver and duct.

4 Tumours pressing on the duct.

5. An obliteration of the common gall duct.

6. A torpid state of the liver and ducts.

7. Thickness of the bile and langour in the intestines, and viscera.

In order to ascertain the existence of any of these causes, it is necessary to pay attention to the symptoms, and previous state of the system.

When an obstruction is the consequence of spasm, it may be known by its coming on suddenly, without any evident premonitory signs; by the patient lying in a bent posture, and by nausea. Antispasmodics are all that are necessary here to relieve.

Inflammation and tumours can scarcely be mistaken. In the former great pain will attend, and the patient inclines to a straight position in bed, the latter can most generally be detected by the sense of touch. They both come on gradually, and are to be treated on the antiphlogistic plan.

It is difficult, and indeed almost impossible to ascertain, when the sides of the common gall duct adhere together, in consequence

of previous inflammation. It seldom occurs, and when it does it is of course incurable. It therefore should never be suspected untill all the remedies for the other causes of obstruction, have been used without affording any relief.

When the hepatic of the liver, and excretory ducts is the cause of the stoppage of the flow of bile, there is a dull sensation in the region of the liver. The pain is accompanied by any is dull. It can be removed by shocks of electricity, or any other powerful stimuli applied to the region of the liver.

The viscidity of the bile is generally the effect of debility in the liver, and languor in the neighbouring viscera. This can be obviated sometimes by stimuli; but occasionally requiring all the remedies which are employed for the cure of Biliary Calculi.

If gall stones or biliary concretions exist in the duct, so as to impede the bile it may be known by the impossibility of performing a cure, untill the concretions are removed, by the presence of calculi in the feces, and by the obstruction alternating upon account of the stones falling into the gall-bladder, and reentering

the duct again.

If the stone or stones in the bile duct should have sharp edges, the pain is excruciating, by the irritation produced the powers of the part are checked, and this is communicated to the whole system inducing spasm in the stomach, and bowels, sometimes causing an inversion in their operations. this is attended with great danger[?], and is a proof of the efforts of nature to resume her usual operations.

The bile is ~~by far~~ mostly obstructed by the presence of gall stones, and is too often hidden under the name of colic, Haller says "Invenie eum morbum vulgarem esse, multo frequentiorem calculo urinariæ vesicæ, esti plerumque sub colicæ nomen latet."

The symptoms indicating an obstruction to the flow of bile, from all the causes which have been enumerated are, a depression of spirits, languor, pain about the stomach, yellowness of the adnata, and slow[?], costive state of the bowels, alternating with a relaxed state, great anxiety, difficult respiration, stools of a dark appearance, clay coloured stools, great flatulency, yellowish impression

made on linen by the urine, loss of appetite, dyspepsia, the colours of objects make a false impression on the retina, a bitterness in the mouth, itchings on the skin, hiccup, a weak quick and tense pulse. This however is irregular and uncertain. It is sometimes precisely the contrary. a shivering now and then occurs. The cause of these shiverings has not been ascertained. Heberden thought they took place during the passage of the stones into the intestines. The victim of this disease, generally labours under considerable anxiety, and fear and as this is a sedative passion, perhaps the weak circulation of the blood may be sufficient to account for these chilly fits. It does not form any insubstantial objection to this idea, that fear is not always attended with this effect, no more than that cold is not sedative because it does not act always perceptibly as such. It has also been said that patients affected with this disease are more apt to die in time of war, than at other times. Those who have once had stones are very subject to returns of it.*

It appears from the observations of Heberden that men and women are equally

* Heberden in his Medical Transactions vol. 2

subject to Biliary concretions.

Before proceeding to enumerate the remedies for gall stones, it will be proper to inquire into their chemical properties, and composition.

In a former part of this essay, it has been mentioned, that detention in the liver and surrounding viscera, would cause a stagnation of the bile, and this would favour an absorbtion or exhalation of the watery particles, while the more compact remained behind. ... or some substance of a solid nature, like sand as a nucleus to which the inspissated bile adheres, forming concretions or gall stones.

Sabatier speaking of the formation of biliary concretions says: "It is a thickening and drying up of the bile."

Some authors have supposed that a chrystalization takes place in the production of these concretions, and indeed this seems to be a fact from the appearance of some of them when fractured.

From the history of the component parts of the bile which has been previously given, it would seem that the observations of Fourcroy on Biliary Calculi are the most correct, and decisive

that have yet been offered.

I have been led to think, that the cause of the production of these calculi depended upon the circumstance, that this viscid matter becoming too abundant by a particular disposition of the bile to remain in solution in it with the acid of the soda, and this humour being by the same disposition thick, and tending to concretion, a chrystallization of this substance took place, sometimes pure and insulated, sometimes mixed with a more or less considerable proportion of biliary matter, and that its different forms which it assumed in its precipitation, depended upon the slowness or the rapidity with which it was deposited. As this matter proceeds manifestly from the concrescible oil of the bile, and as a vegetable resin never assumes a nature similar to that of adipocire, I have thence concluded that the oily matter of the human bile is not a resin, but a substance more or less analogous to spermaceti, a real adipocire, susceptible of assuming the concrete and chrystalline form under certain circumstances.

"I now reckon six genera of human calculi:

"The first are the bilious-hepatic, composed almost entirely of the inspissated bile, deposited in irregular clots in the texture of the liver itself: these are rare.

"The second are the hepatic-adipocious; they are found sometimes in narrow lamina, forming solid points in the parenchyma of this viscus; sometimes they are prominent upon its surface, exhibiting small white or yellowish tumors: they are very rare in this place; frequently perhaps, very small ones of this kind are discharged, and run off with the bilious evacuations.

"The third I call cystic bilious: these are concrete balls, or flakes of thickened bile, granulated, irregular, very various in form and consistence, sometimes friable, brown, or reddish. The calculus of the gall-bladder of the hitchock, which the gramivorous use are of this kind.

"The calculi of the fourth genus are the cortical; of the same nature with the preceding; they are only more dense and covered

with a grey, or white smooth layer, well terminated with regularity.
They hold the second rank with respect to their frequency. They
are frequently found in great numbers in the gall-bladder;
sometimes even they exceed a hundred in number: they are then
polygonous, situated close to each other like pieces of mosaic work, and
distend the gall bladder more or less.

The fifth genus consists of the cystic adhesion calculi; they are
white or grey, opaque without, or semi-transparent, granu-
lated or smooth, covered with a crust of short filaments, or
without crust, formed of entire lamina in their whole thick-
ness, or of rays proceeding from the centre, and divergent to
the circumference: very frequently they are single, and they
have the size and form of pidgeon's eggs. They are more rare
than the preceding; they are mostly found in women. at the
termination of bilious diseases, and almost always of chronic
jaundice, irregular calculi of this sort, somewhat dry or solid,
rather granulated than chrystalline, soft, similar to tallow,
and yellowish, are discharged with the stools.

This kind of adipocerous, or fatty concretion, is much more frequent than has been believed, and may be observed in many subjects when their dejections are carefully examined at the termination of diseases.

Finally, I refer to the sixth genus the mixed cystic, or adipo-bilious calculi, which are mixtures of adipocere and inspissated bile in various proportions: these are most frequent of all, and like those of the fourth genus, they are numerous. They are frequently found mixed with them; sometimes brown, or of a deep green, or olive colour, we see more or less easily in their interior, brilliant streaks or lamellæ, of a deep yellow colour, or only some micaceous points. When they are polyhedral, we observe upon their worn sides, edges of broken crystalline laminæ."*

Saunders suggests the idea of other substances being in these concretions besides those of the bile; but I am disposed to think, however different, the results of the examination of chemists may be, that their component parts precipitated in

* Thomson's Chemistry, Vol. 4 p. 43, 81

the bile. The difference in their composition may be accounted for, from the effects of diseases rendering the nature of the various fluids of the body different. In chronic cathirics, the mucous coat of the intestines conveyed in by our food is absorbed by the lacteals, and carried into the blood vessels. The consequence of this is, the bile receives too great a quantity. A diarrhoea may also tend to alter the composition of these concretions, owing to the mucus of the intestines being discharged, a quantity of which in a natural state is absorbed into the blood, but when we consider the various habits of people, their animal operations, diet, manner of living &c, it is quite enough to explain the varieties of biliary calculi.

They do not appear equally in those parts of the system connected with the secretion of bile. Dissection shews that they are most common in the gall bladder. They are seldom met with in the hepatic duct, but oftener seen in the ductus communis and ductus cysticus.+

Are there any hepatico cystic ducts? Some physiologists in oppo-

+ Saunders

-ution to the idea of the regurgitation of bile into the ductus cysticus, have contended for this opinion; but experiment the touch stone of reasoning contradicts the notion. If fluids are injected into the liver by means of the hepatic duct, they cannot be traced into the vesicula fellis: hence we may reasonably conclude that these communications do not exist.

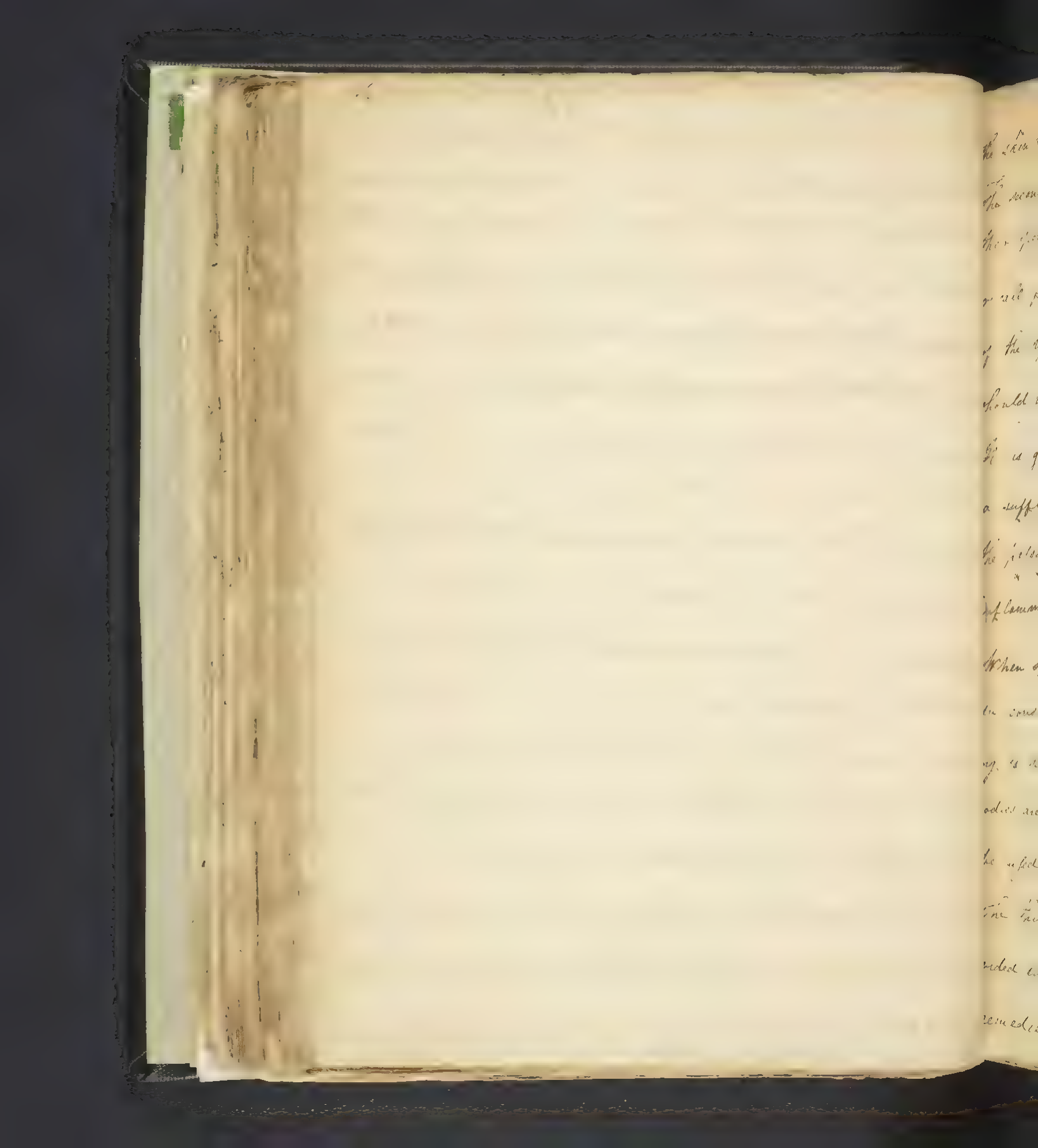
The remedies for the cure of this disease are [illegible] [illegible] [illegible] orders

1. Those which are useful in the forming state of the disease.

2. Those which are useful during the paroxysm, and

3. Those which perform a cure.

The remedies which come under the first head, are small doses of [illegible] laudanum, warm bath, a gentle purge &c. They should be used whenever we suspect any thing like concretions forming. The premonitory signs are generally a languid state of the body, dull pain in the right side, costive state of the bowels, a tinge of yellowness on



the same.

The second class of remedies are of course more active and decisive in their operations than the first, in consequence of their being a great or call for relief during the paroxysm, than in any other stage of the disease. Blood-letting is of extreme importance, and should be resorted to immediately provided the pulse is tense. It is generally attended with great advantage. By this remedy a sufficient relaxation may take place in the duct, to favour the passage of the stones into the intestines. It will also prevent inflammation, from the irritation produced by the stones.

When spasm or an inversion of the intestinal actions occurs, in consequence of sharp stones irritating the duct blood-letting is very serviceable. Opium and the warm bath as antispasmodics are of the greatest utility. The various antispasmodics should be used. Injections and purgatives medicines are good.

The third class or those which perform a cure may be divided into Mechanical, and Chemical and comprise all the remedies which have been enumerated, in conjunction with

these.

The mechanical remedies are,

1. Emetics.

2 Cathartics

3 Laxatives

4 Clysters.

I shall now make a few observations on each, and

1st, Cullen speaking of jaundice says. There is no means of

judging from the nature of the disease, that is more probable

than the action of vomiting; which by compressing the abdominal viscera, and particularly the gall and duct and bladder, and biliary vessels may contribute sometimes greatly

enough to the solution of the biliary duct; recommending

it has often been found useful for this purpose, but at

the same time it is possible that the force exerted in the

act of vomiting, may be too violent, and therefore parti-

cularly ought to be employed." Dr Saunders recom-

mends Ipecacuanha as better than other vomits. He advises it

to be given in small doses at first; so as to create great nausea before it excites purging. If we have any reason to suppose the first stones are small, tartarized antimony should be given, and gradually will remove them. Aloine pill has been recommended for a similar purpose; but to be taken during the paroxysme of the spasm.*

2nd. The benefit derived from cathartics in the cure of this disease, depends on the power they have in exciting the peristaltic motion of the intestines, and particularly of the duodenum; by which the stone is not unfrequently projected from the duct into this intestine. Of this increased action of the intestines, is the greatest good derived from purges it follows that the most stimulating are the best; consequently the senecine, that calomel, and jalap and aloes and calomel have been found the most successful.

Larsow gave with success 12 grs calomel at night succeeded in the morning by a dose of oil. Emetics and cathartics combined have been followed by the best effects. Can be given

[illegible] and calomel are most preferable; but Ipecacuanha will also do. The last in irritable habits is best.

3d. Stimulants. Reflecting on the causes of this disease, it must be obvious that stimulants, as [illegible] [illegible] considerable [illegible] its cure. The most common stimulants are, cantharides, [illegible] [illegible] of [illegible], [illegible] [illegible], blisters, opium &c.

The tincture of cantharides rubbed on the abdomen may be attended with considerable utility, and [illegible] electricity are necessary to remove the torpidity of the nervous stomach &c. Water acts only from its distending the stomach, sometimes forcing the stones out of the duct.

Mercury has been found serviceable combined with opium, so as to excite the salivary glands, followed by purges to prevent a violent degree of mercurial action. Practice however has taught us that salivation in some cases is of importance. In Duncan's Annals of Medicine vol 1. the history of several cases is given by Dr Gibbons which were cured by

this remedy. He supposes in some of them, that the calomel performed the cure by increasing the bile, promoting the exit of the stones; in others he was of opinion it acted as a solvent. It is possible it might have been beneficial in both ways.

When the mouth cannot be affected by the internal use of mercury, mercurial inunction may be used on the armpits, and over the region of the liver.

Cicuta or hemlock, no doubt acts sometimes as a stimulant, but usually, it is a sedative, and most of its advantages perhaps are derived from this quality.

Exercise, this is necessary to promote a regular circulation of the blood, and an equilibrium of excitement, and excitability in which health consists. If inflammation of the liver takes place, in consequence of the irritation of stones and a swelling of this viscus ensues, blisters should be successively applied until it is reduced. They are of considerable importance and act as a charm in removing pain.

Opium by most practitioners is accounted as a valuable remedy. It is the best narcotic, quiets pain, and is very instrumental in the cure of this disease. Dr Pettigrew in the memoirs of the medical society of London has exemplified its use, in a very important case.†

5th Sedatives. There are so few remedies strictly appertaining which come under this class, that it is almost unnecessary to mention it. In compliance with the custom however we insert it. Bleeding if the pulse is tense, & there is evil much pain is necessary. In people of full habits it may be used with safety, to a great extent.

Relief in this disease has been obtained by smoking tobacco. A case is related by Dr Prescott to the Massachusetts Medical Society of this kind, after death which was produced by an accident independant of her disease. One hundred and fourteen gall stones of various sizes were found in the gall bladder.

The chemical remedies for the cure of this disease, are but

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[illegible] and are only to be used when the symptoms are moderate, as they are too weak in their operation [illegible] to [illegible] before they reach the disease to have an immediate effect.

[illegible] not convinced of the ability [illegible] from the use of [illegible] the [illegible] [illegible] [illegible] them of no lasting value.

"Uric acid calculi being soluble in the caustic alkalies, in the solution of drops, are made to yield and disappear, [illegible] and [illegible] [illegible] [illegible] [illegible] [illegible] to each [illegible]. They ought to be attacked with these remedies, administered in a judicious manner.*

Each of the alkalies has been used, but the soda is said to be most preferable. Upon account of its mildness, it is not so apt to corrode the bodily parts it comes in contact with during its circulation through the body. It is given in the water of the supercarbonate of soda, or the bicarbonate.

* Hallock says that he has [illegible] in the solution of [illegible]

[illegible]

gland, if they feel a sight loss of jaundice in the commencement of the warm season, use the ley of wood ashes & copious morning drinks, and generally remove all uneasiness by this practice.

Ammonia has also been given in the dose of a scruple three times a day for the cure of jaundice caused by calculi in the ducts. It is advised to begin with small doses of the Mineral and vegetable alkalies, and increase them in proportion to the susceptibility of the stomach.

Sulphur either combined with the yolk of an egg. has been recommended. It has been also combined with the white of an egg, and tried with advantage.

In administering the alkalies to patients, it is occasionally of the utmost importance to excite the Sanguid liver, and stomach at the same time. Here we are compelled to unite the soda with some stimulating substances such as white pepper. turpentine Rad. Rhei &c.

The alkalies in the cure of this disease according to the new an-

have taken of the subject, are in the first place absorbed into the blood, and conveyed to the liver when an excess must of course enter into the bile. This passing to the vesicula fellis by regurgitation enters into union with the adipocire of the gall stone, and dissolves it gradually away, or lessens it so much that its passage through the duct is facilitated, or rendered easy. They also dissolve the yellow matter according to Thenard and Thompson.

Sometimes the cure of this disease occurs in a manner which has not as yet been taken notice of. Inflammation takes place in the gall bladder. It unites to the parietes of the abdomen, — suppuration commences, a tumour is formed, and stones are discharged externally. Dr Thomas says in his "Practice of Physic," "An interesting case of inflammation of the gall bladder proceeding from biliary calculi, and terminating in suppuration, which at length pointed externally lately came under my observation. The patient was a women about 40 Years of age, who for a considerable time had been severely afflicted

with pain in the stomach, febrile heat, faintings, and a purg-
-ing. After a month or so there arose a swelling near the navel,
which upon being opened discharged a quantity of yellow
matter for many days. The pain becoming very acute in
the tumour, the surgeon was induced to introduce his probe
into the orifice of the wound, when, to his astonishment
he found a hard gritty substance, at the bottom of it,
which upon being discharged a few days afterwards proved to
be a gall stone of the size of a common nut. This was shortly
afterwards succeeded by another, and at the present period
the woman seems to be in a fair way of recovery."
J. Lud. Petit, has even ventured to open the gall bladder in this
disease, and performed a cure. J. Zacharias Vogel has also
performed the operation.